

3.2 - Solving Problems by Solving Equations

Curriculum Outcomes	Related Activities	Page in Text
<ul style="list-style-type: none">• apply properties of numbers when operating upon expressions and equations• model (with concrete materials and pictorial representations and express the relationships between arithmetic operations and operations on algebraic expressions and equations• interpret solutions to equations based on context	<p>Investigation and Focuses to have students explore and develop a process by which they can:</p> <ul style="list-style-type: none">• solve an equation of the form $ax + b = c$• interpret the solution to an equation in the form $ax + b = c$ to ensure it is reasonable in the original problem	104 108

Solving an Equation:

- Requires finding the value of the variable that makes the equation true
- Finding a good representation or model is often the key to solving a problem
- Occurs when a problem involves a relationship that can be written algebraically (with variables)

Steps to Solving Equations:

1. Isolate the variable on one side of the equation.

* if needed:

- Remove brackets by using the distributive property
- When using fractions, multiply by the LCM

2. Divide both sides by the coefficient (multiplier of the variables).

$$\begin{array}{l} 2x = 10 \\ \frac{2x}{2} = \frac{10}{2} \end{array}$$

3. Simplify where possible.

Example 1:

Steps to Solving Equations With One Unknown	Example 1: $8 + 6x = 50$
1) Isolate the term with the variable on one side of the equation. Subtract 8 from both sides	1) $8 + 6x = 50$ $\xrightarrow{-8}$ $6x = 50 - 8$ $6x = 42$
2) Divide both sides by the coefficient multiplied by the variable.	2) $\frac{6x}{6} = \frac{42}{6}$
3) Simplify where possible.	3) $x = \frac{42}{6}$ $x = 7$

$$\begin{array}{l} 8 + 6x = 50 \\ -8 \quad -8 \\ \hline 6x = 42 \\ \div 6 \quad \div 6 \\ \hline x = 7 \end{array}$$

How to verify your answer:

Example 1:

$$8 + 6x = 50$$

Answer--> $x = 7$

Left side	Right side
$8 + 6x$	50
$8 + 6(7)$	
$8 + 42$	
50	

Example 2:

Steps to Solving Equations With One Unknown	Example 2: $8(g - 3) = -25$
1) Isolate the term with the variable on one side of the equation. Where applicable: <ul style="list-style-type: none"> remove brackets using the distributive property multiply by the LCM and simplify fractions 	1) $8(g - 3) = -25$ $8g + (8)(-3) = -25$ $8g - 24 = -25$ $\quad \quad \quad \rightarrow +24$ $8g = -25 + 24$ $8g = -1$
2) Divide both sides by the coefficient multiplied by the variable.	2) $\frac{8g}{8} = \frac{-1}{8}$
3) Simplify where possible.	3) $\frac{8g}{8} = \frac{-1}{8}$ $g = \frac{-1}{8}$

Example 2:

$$8(g - 3) = -25$$

A/S

D/M

$$\begin{array}{rcl} 8g - 24 & = & -25 \\ +24 & & +24 \end{array}$$

$$\frac{8g}{8} = \frac{-1}{8}$$

$$g = \frac{-1}{8}$$

$$-2(3y - 7) = 56$$

$$\begin{array}{rcl} -6y + 14 & = & 56 \\ -14 & & -14 \end{array}$$

$$\begin{array}{rcl} +6y & = & 42 \\ -6 & & -6 \end{array}$$

$$\boxed{y = -7}$$

$$15 - 1(4m - 5) = 32$$

$$15 - 4m + 5 = 32$$

$$20 - 4m = 32$$

$$\begin{array}{r} -20 \\ \hline \end{array}$$

$$\begin{array}{r} +4m = 12 \\ \hline -4 \quad -4 \end{array}$$

$$m = -3$$

Example 2:

$$8(g - 3) = -25$$

① Multiplying 8 by both terms in brackets.

$$\begin{array}{r} \textcircled{1} \quad 8g - 24 = -25 \\ \quad \quad + 24 \quad + 24 \end{array}$$

② Add 24 to both sides

$$\textcircled{2} \quad 8g = -1$$

③ Divide by 8 on both sides

$$\textcircled{3} \quad \frac{8g}{8} = \frac{-1}{8}$$

$$g = -\frac{1}{8}$$

Check

LS	RS
$8(g-3)$	-25
$8(-\frac{1}{8}-3)$	-25
$-1-24$	-25
-25	$= -25$

How to verify your answer:

Example 2:

$$8(g - 3) = -25$$

Answer--> $x = \frac{-1}{8}$

Left side	Right side
$8(g - 3)$	-25
$8(-1/8 - 3)$	
$-8/8 - 24$	
$-1 - 24$	
-25	

$$\underline{-2(3y - 7) = 56}$$

$$\underline{-6y + 14 = 56}$$

$$\underline{-6y = 42}$$

$$y = -7$$

j) $13x + 7(-3x - 1) = -63$

$$\underline{13x - 21x - 7 = -63}$$

$$\underline{-8x - 7 = -63}$$

$$\underline{-8x = -56} \quad x = +7$$

$$15 - (4m - 5) = 32$$

$$15 - 4m + 5 = 32 \quad \text{Combine like terms}$$

$$20 - 4m = 32$$

$$\begin{array}{r} -20 \\ \hline -4m = 12 \\ \hline -4 \quad -4 \\ \hline m = -3 \end{array}$$

A/s
m/d

$$5(4 + 2x) - (8x - 12) = 68$$

$$20 + 10x - 8x + 12 = 68 \quad \text{Combine like terms}$$

$$32 + 2x = 68$$

$$\begin{array}{r} -32 \\ \hline 2x = 36 \\ \hline \frac{2x}{2} = \frac{36}{2} \\ \hline x = 18 \end{array}$$

What Is The Title Of This Picture?

CODED TITLE:

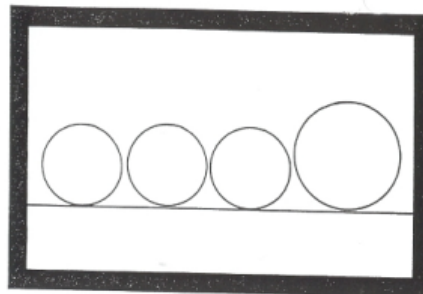
18 -6 6 2 -5 -7 2 -5 -3 6 -5

7 -1 4 -4 -7 8 -5 -3 -7

-13 6 2 1 -3 -1 3 8 4 -13 -7 -2

TO DECODE THE TITLE OF THIS PICTURE:

Solve any equation below and find the solution in the code above. Each time the solution appears, write the letter of that exercise above it. Keep working and you will discover the title.



Ⓘ $5(x + 4) = 40$

Ⓔ $-2(3y - 7) = 56$

Ⓒ $6(1 - 4w) = -18$

Ⓕ $4(2x + 5) - 8 = 36$

Ⓐ $2(5 - 3v) + 9v = 28$

Ⓔ $7 - 3(5t - 10) = 67$

Ⓐ $-9(6 + u) - 2u = -10$

Ⓙ $13x + 7(-3x - 1) = -63$

Ⓗ $15 - (4m - 5) = 32$

⓪ $-2(-7k + 4) + 9 = -13$

⓪ $-5y - 5(-6 - 2y) = 0$

Ⓓ $3(1 + 4n) - 2(5n - 3) = 25$

Ⓖ $-6(x - 2) + 4(3 - 6x) = -36$

Ⓒ $5(4 + 2x) - (8x - 12) = 68$

Ⓣ $-3(-4 - 6y) + 7(-y + 5) = -8$

Ⓜ $8(2w - 6) + 4(-1 - 5w) = 0$

Ⓗ $15 - (4m - 5) = 32$

Ⓔ $7 - 3(5t - 10) = 67$

$$\textcircled{J} \quad 13x + 7(-3x - 1) = -63$$

$$13x - 21x - 7 = -63$$

$$\begin{array}{r} -8x - 7 = -63 \\ +7 \quad +7 \end{array}$$

$$\begin{array}{r} +8x = -56 \\ \hline -8 \quad -8 \end{array}$$

$$\boxed{x = +7}$$

$$\textcircled{N} \quad -9(6+u) - 2u = -10$$

$$-54 - 9u - 2u = -10$$

$$\begin{array}{r} -54 - 11u = -10 \\ +54 \quad +54 \end{array}$$

$$\begin{array}{r} -11u = 44 \\ \hline -11 \quad -11 \end{array}$$

$$\boxed{u = -4}$$

$$\textcircled{A} \quad 2(5-3v) + 9v = 28$$

$$10 - 6v + 9v = 28$$

$$10 + 3v = 28$$

$$\begin{array}{r} 10 + 3v = 28 \\ -10 \quad -10 \\ \hline 3v = 18 \end{array}$$

$$\begin{array}{r} 3v = 18 \\ \hline v = 6 \end{array}$$

$$v = 6$$

How Do You Buy Something In Mexico?

For any sentence below, circle the member of the given replacement set that is the solution. Find your answer in the code key and notice the letter next to it. Print this letter in the box at the bottom of the page that contains the number of that exercise. Keep working and you will discover the answer to the title question.



- | | | | |
|--------------------|------------------|-----------------------|-----------------|
| ① $3y + 9 = 15$ | $\{4, 2, -2\}$ | ⑫ $18 - 2x = 6x - 14$ | $\{4, 3, 2\}$ |
| ② $7 + 4x = -1$ | $\{3, -3, -2\}$ | ⑬ $6y - 10 = y + 25$ | $\{7, -3, -1\}$ |
| ③ $26 - 8t = -30$ | $\{5, 7, 8\}$ | ⑭ $-2t + 7 = 5t - 56$ | $\{1, 5, 9\}$ |
| ④ $11 = 6x - 13$ | $\{4, -2, 1\}$ | ⑮ $8 + 15a = 11a$ | $\{2, -2, 3\}$ |
| ⑤ $-7n + 5 = 12$ | $\{9, -3, -1\}$ | ⑯ $5 - y = -4y + 29$ | $\{-8, 8, -4\}$ |
| ⑥ $16 - 4x = 24$ | $\{2, -2, 7\}$ | ⑰ $2 - 7k = -k + 20$ | $\{6, -6, -3\}$ |
| ⑦ $-75 = -25 + 5d$ | $\{5, -10, 10\}$ | ⑱ $3n + 3 = 2n - 4$ | $\{-7, 1, -5\}$ |
| ⑧ $-8 = -2y - 18$ | $\{4, -4, -5\}$ | ⑲ $-8x + 1 = 81 + 2x$ | $\{-4, -8, 8\}$ |
| ⑨ $9u - 16 = 20$ | $\{4, 3, 2\}$ | ⑳ $-12m = 5m + 68$ | $\{5, -9, -4\}$ |
| ⑩ $-12 = 12r + 24$ | $\{-1, -2, -3\}$ | ㉑ $9x - 27 = 12 - 4x$ | $\{4, 3, -3\}$ |
| ⑪ $52 + 21p = 10$ | $\{-1, -2, 2\}$ | ㉒ $-5 + 7y = 43 - y$ | $\{6, 1, 10\}$ |

13	2	12	22	1	20	11	19	4	16	7
5	10	18	3	15	9	6	21	17	14	8

CODE KEY

-10	H
-9	K
-8	M
-7	D
-6	G
-5	T
-4	S
-3	N
-2	O
-1	A
1	R
2	E
3	W
4	U
5	L
6	P
7	Y
8	C
9	I
10	V

$$\textcircled{13} 6y - 10 = y + 25$$

$$\textcircled{17} 2 - 7k = -k + 20$$

$$\textcircled{14} -2t + 7 = \cancel{5t} - 56$$

$$\begin{array}{r} -5t \quad -5t \end{array}$$

$$\begin{array}{r} -7t + 7 = -56 \\ -7 \quad -7 \end{array}$$

$$\begin{array}{r} +7t = -63 \\ \hline -7 \end{array}$$

$$t = 9$$

Classwork/Homework

Page 106 #3, 4a-h

Note: for #4 just solve each equation

Equations with Fractions

Step #1: Clear all fractions by multiplying through by a number that all the denominators will divide into. Everything, including the non fraction terms must be multiplied by this number.

Step #2: Get like terms together by doing the opposite operation already being done. Get all the variables on one side and all the numbers on the other.

Step #3: Divide by the coefficient to get the variable alone.

Example 3:

Example 3:

$$\frac{1}{3}(5x-1) + \frac{3}{2}(x+7) = 20$$

$$6 \cdot \left(\frac{5x}{3} - \frac{1}{3} + \frac{3x}{2} + \frac{21}{2} \right) = (20) \cdot 6$$

(3 and 2 can go into 6, so multiply all terms by 6)

$$\frac{30x}{3} - \frac{6}{3} + \frac{18x}{2} + \frac{126}{2} = 120$$

Simplify

$$10x - 2 + 9x + 63 = 120$$

Combine like terms

$$19x + 61 = 120$$

$$-61 \quad -61$$

subtract 61 from both sides

$$19x = \frac{59}{19}$$

Divide by 19 on both sides

$$x = \frac{59}{19} = 3\frac{2}{19}$$

Reduce the fraction.

Example 3:

$$\frac{1}{3}(5x-1) + \frac{3}{2}(x+7) = 20$$

$$6 \times \left(\frac{5x}{3} - \frac{1}{3} + \frac{3x}{2} + \frac{21}{2} \right) = (20) \times 6$$

$$\frac{30x}{3} - \frac{6}{3} + \frac{18x}{2} + \frac{126}{2} = 120$$

$$\underline{10x} - \underline{2} + \underline{9x} + \underline{63} = 120$$

$$\begin{array}{r} 19x + 61 = 120 \\ -61 \quad -61 \\ \hline \end{array}$$

$$\frac{19x}{19} = \frac{59}{19}$$

$$x = \frac{59}{19}$$

$$x = 3\frac{2}{19}$$

$$x = 3.1$$

Solve each of the following:

$$\bullet 3x + 2 = 8$$

$$\bullet 4 = 2(x-5)$$

$$\bullet 3x - 7 = -1$$

$$\bullet 4x + 3.5 = 7.5$$

$$\bullet 3(m - 2/3) = 25$$

$$\bullet \frac{3}{5}(x+1) - \frac{1}{5}(x+2) = 15$$

$$\bullet \frac{2}{3}x + \frac{1}{4} = \frac{3}{5}$$

$$5 \times \left(\frac{3x}{5} + \frac{3}{5} - \frac{1x}{5} - \frac{2}{5} \right) = (15) \times 5$$

$$\frac{15x}{5} + \frac{15}{5} - \frac{5x}{5} - \frac{10}{5} = 75$$

$$\underline{3x + 3 - 1x - 2} = 75$$

$$\underline{2x + 1} = 75$$

$$\frac{2x + 1}{2} = \frac{74}{2}$$

$$\boxed{x = 37}$$

$$6 \times \left(\frac{3x}{5} + \frac{2}{4} \right) = \left(\frac{1}{3} \right) \times 60$$

$$\frac{180x}{5} + \frac{120}{4} = \frac{60}{3}$$

$$\frac{36x + 30}{-30} = \frac{20}{-30}$$

$$\frac{36x}{36} = \frac{-10}{36}$$

$$x = \frac{-10}{36}$$

Classwork/Homework

Page 106 #3, 4a-h

Note: for #4 just solve each equation

Page 107 #8 Solve each equation

#3. a) $3x + 2 = 8$
 $-2 \quad -2$

$$\frac{3x}{3} = \frac{6}{3}$$

$$\boxed{x=2}$$

#4. h, f, d

d) $4 - 5x = 15$
 $+4 \quad +4$

$$\frac{-5x}{-5} = \frac{19}{-5}$$

$$x = -3\frac{4}{5}$$

$$x = -\frac{19}{5} = -3\frac{4}{5}$$

$$x = -3.8$$

d 4

f) $3k + 16 = \left(\frac{8}{3}\right) \cdot 3$

$$3k + 16 = 8$$

$$-16 \quad -16$$

$$\frac{3k}{3} = \frac{-8}{3}$$

$$\boxed{k = -4\frac{2}{3}}$$

$$k = -4.4$$

h) $15 = 30 - 6h$

$$30 - 6h = 15$$

$$-30 \quad -30$$

$$\frac{-6h}{-6} = \frac{-15}{-6} \quad h = \frac{5}{2} = 2\frac{1}{2}$$

Pg. 107 #8 a, e, f

a) $3\left(m - \frac{2}{3}\right) = 25$

$$3m - 2 = 25$$

$$+2 \quad +2$$

$$\frac{3m}{3} = \frac{27}{3}$$

$$\boxed{m=9}$$

e) $\left(\frac{2x}{3} + \frac{1}{4}\right) \cdot \frac{60}{5} = 60$

$$\frac{120x}{3} + \frac{60}{4} = \frac{180}{5}$$

$$40x + 15 = 36$$

$$-15 \quad -15$$

$$\frac{40x}{40} = \frac{21}{40}$$

$$\boxed{x = \frac{21}{40}}$$

f) $\frac{3}{4}(x+1) - \frac{16x+2}{5} = 15$

20 · $\left(\frac{3x}{4} + \frac{3}{4} - \frac{16x}{5} - \frac{2}{5}\right) = 15 \cdot 20$

$$\frac{60x}{4} + \frac{60}{4} - \frac{320x}{5} - \frac{40}{5} = 300$$

$$15x + 15 - 64x - 8 = 300$$

$$11x + 7 = 300$$

$$-7 \quad -7$$

$$\frac{11x}{11} = \frac{293}{11}$$

$$x = 26\frac{7}{11}$$

$$\frac{26}{11} = \frac{286}{11}$$

Classwork/Homework

Page 106 #3, 4a-h

Note: for #4 just solve each equation

Page 107 #8 Solve each equation

#3 a) $3x + \frac{1}{2} = 8$

$$\frac{3x}{3} = \frac{6}{3} \quad \boxed{x=2}$$

#4. a) $\frac{x(m+3)}{3} = \frac{22}{3}$ $2m + \frac{1}{6} = \frac{22}{3}$

$$\frac{m+3}{3} = \frac{22}{3}$$

$$m+3 = 22$$

$$-3 \quad -3$$

$$m = 19$$

f) $(3k + 16) = \frac{8}{3}$

$$9k + 48 = 8$$

$$-48 \quad -48$$

$$\frac{9k}{9} = \frac{-40}{9} \quad k = -\frac{40}{9} \quad k = -4.\bar{4}$$

g) $3(m - \frac{2}{3}) = 25$

$$3m - 2 = 25$$

$$+2 \quad +2$$

$$\frac{3m}{3} = \frac{27}{3} \quad \boxed{m=9}$$

h) $\frac{3x}{5} + \frac{1}{4} = \frac{2}{5}$

$$\frac{120x}{5} + \frac{10}{4} = \frac{180}{5}$$

$$24x - 25 = 36$$

$$+25 \quad +25$$

$$\frac{24x}{24} = \frac{61}{24} \quad \boxed{x = \frac{61}{24}}$$

f) $\frac{3}{4}(x+1) - \frac{1}{5}(x+2) = 15$

$$20x \left(\frac{3x}{4} + \frac{3}{4} - \frac{1x}{5} - \frac{2}{5} \right) = (15) \times 20$$

$$\frac{60x}{4} + \frac{60}{4} - \frac{20x}{5} - \frac{40}{5} = 300$$

$$15x + 15 - 4x - 8 = 300$$

$$11x + 7 = 300$$

$$-7 \quad -7$$

$$\frac{11x}{11} = \frac{293}{11}$$

$$\boxed{x = 26\frac{7}{11}}$$

$$x = 26.63$$

Warm-up #14

Copy and Complete

1) $3x + 20 = 38$

2) $4x - 5 = 2x + 3$

3) $3(x+2) = 4$

4) $\frac{2x}{3} - \frac{2}{7} = 30$

5) $\frac{x-2}{3} = \frac{x}{2}$

$$\begin{array}{r} 1) \ 3x + 20 = 38 \\ \quad -20 \quad -20 \\ \hline 3x = 18 \\ \quad \div 3 \quad \div 3 \end{array} \quad \boxed{x=6}$$

$$\begin{array}{r} 2) \ 4x - 5 = 2x + 3 \\ \quad -2x \quad -2x \\ \quad +5 \quad +5 \\ \hline 2x = 8 \\ \quad \div 2 \quad \div 2 \end{array} \quad \boxed{x=4}$$

$$\begin{array}{r} 3) \ 3(x+2) = 4 \\ \quad 3x + 6 = 4 \\ \quad \quad -6 \quad -6 \\ \hline 3x = -2 \\ \quad \div 3 \quad \div 3 \end{array} \quad \boxed{x = -\frac{2}{3}}$$

21.
4) $\left(\frac{2x}{3} - \frac{2}{7}\right) = (30) \cdot 21$

$$\frac{42x}{3} - \frac{42}{7} = 630$$

5) $6 \cdot \left(\frac{x-2}{3}\right) = \left(\frac{x}{2}\right) \cdot 6$

$$14x - 6 = 630$$

$$\frac{6x}{3} - \frac{12}{3} = \frac{6x}{2}$$

$$4x = \frac{636}{14}$$

$$\begin{array}{r} 2x - 4 = 3x \\ -2x \quad -2x \end{array}$$

$$x = 45\frac{6}{14} \leftarrow$$

$$\boxed{-4 = x}$$

$$\boxed{x = 45\frac{3}{7}}$$

Pg. 106 #4. a, b, c, d, i

(a) $2(m+3)=22$ $\frac{2m}{2} = \frac{16}{2}$
 $2m+6=22$ $m=8$

(b) $3y-4=2$ $\frac{3y}{3} = \frac{6}{3}$ $y=2$

(c) $5-x=9$ $\frac{-1x}{-1} = \frac{4}{-1}$ $x=-4$

(d) $-4-5x=15$ $x = -\frac{19}{5} = -3\frac{4}{5}$
 $-5x=19$ $x=-3.8$

(i) $\frac{2}{3}(x-2) + \frac{1}{2}(x-2) = 1$ ✓
 $\frac{2x}{3} - \frac{4}{3} + \frac{1x}{2} - \frac{1}{2} = 1$ ✓
 $\Rightarrow 4x - 8 + 3x - 6 = 6$ ✓
 $\Rightarrow 7x - 14 = 6$ ✓
 $\frac{7x}{7} = \frac{20}{7}$ $x = \frac{20}{7} = 2\frac{6}{7}$ 2.9

Practice:

1. $\frac{4}{5}x + 1 = 5$

2. $3k + 16 = \frac{8}{3}$

Class work / Homework:

- Copy the following questions into your notebook, and complete. Verify 3 of your answers.

$$1. \quad 3k + 16 = \frac{8}{3}$$

$$2. \quad \frac{x}{-4} = 5$$

$$3. \quad -8 + x = \frac{-29}{4}$$

$$4. \quad \frac{3}{4} + 2x = \frac{3}{5}$$

$$5. \quad \frac{1}{2}x + \frac{1}{3}x + 5 = 10$$

$$6. \quad 6 = \frac{1}{3}x - 2$$

$$7. \quad 4x + \frac{3}{2}x = 24$$

Class work / Homework:

Complete the following:

- Pizzazz sheet - "Daffynition Decoder"
- Questions: pg. 107 # 8 e
pg. 114 #11 c and d
pg. 116 #25 c

Daffynition Decoder

1. Condense: _____
 $\overline{-50\ 45\ 21\ -63\ -8\ 44\ 32\ -40\ -63\ -40\ -72\ -50\ -28}$

2. Program: _____
 $\overline{-40\ -72\ -5\ -50\ 19\ 14\ 32\ 14\ -5\ -180\ 6\ 4\ -63\ 4\ -180\ 32\ -40\ 44\ 18\ 36\ 18\ -180\ 4\ -63}$

Solve any equation below and find the solution in the code. Each time it appears, write the letter of the exercise above it. Keep working and you will decode the two de-fun-itions.

Ⓡ $\frac{x}{2} - 5 = 11$

Ⓞ $\frac{w}{7} + 4 = 6$

Ⓨ $\frac{1}{3}t - 9 = 3$

ⓔ $7y - 2 = 26$

Ⓑ $8 - 4k = 40$

Ⓐ $\frac{-1}{5}k + 1 = 11$

Ⓝ $7 + \frac{m}{8} = -2$

Ⓤ $47 = 2d + 5$

ⓗ $-6u + 7 = -29$

Ⓒ $12 - \frac{v}{4} = 1$

Ⓛ $-6 - \frac{1}{2}n = 8$

Ⓕ $-61 = 12p - 1$

Ⓣ $\frac{1}{10}y + 2 = -16$

ⓓ $18 - \frac{x}{15} = 15$

Ⓥ $3 + 5q = 98$

Ⓢ $-6 + \frac{1}{3}w = 0$

Ⓢ $10 - x = 50$

Ⓜ $\frac{-v}{9} + 7 = 14$

- Ques: pg. 107 # 8 e, pg. 114 #11 c and d, pg. 116 #25 c

107 # 8 e) $\frac{2x}{3} + \frac{1}{4} = \frac{3}{5}$

Pg. 114 #11 c) $\frac{1x}{4} + \frac{2x}{3} = \frac{1}{4}$

d) $\frac{3y}{5} + \frac{1y}{2} = 12$

Pg. 116 #25 c) $\frac{2x}{3} + 2 = \frac{3x}{5} - 5$

Practice:

1. $3(m - \frac{2}{3}) = 25$

2. $\frac{3}{5}(x+1) - \frac{1}{5}(x+2) = 15$

Class work / Homework:

Complete the following:

- Page 106 #4, i, and j
- Page 107 #8 f
- Page 116 #21 g
- Page 153 #6 b

Practice:

1. $\frac{x+3}{2} = \frac{3x}{2}$

2. $\frac{x-3}{2} = \frac{x+1}{4}$

3. $\frac{2x+5}{6} - \frac{2}{3} = \frac{2x}{5}$

3. $\frac{2x+5}{6} - \frac{2}{3} = \frac{2x}{5}$ $\cdot 30$

$$\frac{60x}{6} + \frac{150}{6} - \frac{60}{3} = \frac{60x}{5}$$

$$10x + 25 - 20 = 12x$$

$$10x + 5 = 12x$$

$$-10x \quad -10x$$

$$\frac{5}{2} = \frac{2x}{1} \quad x = \frac{5}{2}$$

$$x = 2\frac{1}{2}$$

Class work / Homework:

Complete the following:

- Copy the following questions into your notebook and solve for each.

Solve for the variable in each of the following equations:

1)

$$\frac{x+2}{3} = \frac{x}{2}$$

2)

$$\frac{x-2}{5} = \frac{x+1}{2}$$

3)

$$\frac{x}{5} = \frac{x-2}{4}$$

4)

$$\frac{2x+4}{3} + \frac{3x+7}{5} = \frac{10x+11}{3}$$

5)

$$\frac{5x+3}{6} - \frac{3x-5}{4} = \frac{x+1}{2}$$

6)

$$\frac{4x-8}{3} + \frac{x+9}{7} = \frac{3x-3}{2}$$

- Questions: Page 115 #14 b, c; #15; #17; #25

(3) $20 \cdot \left(\frac{x}{5} \right) \left(\frac{x-2}{4} \right) = 20$

$$\frac{20x}{5} = \frac{20x}{4} \cdot \frac{46}{4}$$

$$4x = 5x - 10$$

$$-5x = -5x$$

$$\frac{-4x}{-1} = \frac{-10}{-1} \quad \boxed{x=10}$$

(4) $15 \cdot \left(\frac{2x+4}{3} + \frac{3x+7}{5} \right) \left(\frac{10x+11}{3} \right) = 15$

$$\frac{30x}{3} + \frac{60}{3} + \frac{45x}{5} + \frac{105}{5} = \frac{150x}{5} + \frac{165}{5}$$

$$10x + 20 + 9x + 21 = 30x + 33$$

$$19x + 41 = 30x + 33$$

$$-19x = -8$$

$$\frac{-19x}{-19} = \frac{-8}{-19} \quad \boxed{x = \frac{8}{19}}$$

(5) $12 \cdot \left(\frac{4x-8}{3} + \frac{x+9}{7} \right) \left(\frac{3x-3}{2} \right) = 42$

$$\frac{168x}{3} - \frac{336}{3} + \frac{42x}{7} + \frac{378}{7} = \frac{126x}{2} - \frac{126}{2}$$

$$56x - 112 + 6x + 54 = 63x - 63$$

$$62x - 58 = 63x - 63$$

$$-62x = -62x$$

$$-58 = x - 63$$

$$+63 = +63$$

$$\boxed{5 = x}$$

Class work / Homework:

Complete the following:

Pizzazz sheet: "Double Cross"

DOUBLE CROSS

1. What do you get when you cross an absent-minded elephant with a small flea?

Answer:

$\frac{1}{2} \quad -4 \quad \frac{9}{4} \quad -\frac{17}{15} \quad \frac{30}{7} \quad -2 \quad 1 \quad 23 \quad -2 \quad \frac{30}{7} \quad 5 \quad \frac{1}{2} \quad 1$

2. What do you get when you cross a shark with a snowball?

Answer:

$-4 \quad -\frac{17}{15} \quad \frac{9}{4} \quad \frac{11}{2} \quad 1 \quad -\frac{5}{4} \quad 20 \quad 1 \quad -2$

Solve each equation below and find the solution in the code. Each time the solution appears, write the letter of that exercise above it.

(G) $\frac{x}{5} + \frac{2x}{3} = 5$

(I) $\frac{8x}{5} - \frac{3x}{2} = 6$

(O) $\frac{2m-3}{2} = \frac{3}{5}$

(S) $\frac{1}{3}(x+5) = \frac{7}{10}$

(A) $\frac{3x-1}{4} + \frac{1}{2} = \frac{3}{8}$

(E) $\frac{2x+2}{3} - \frac{5x}{4} = \frac{11}{12}$

(M) $\frac{1}{2}(2x-1) = \frac{1}{3}(x+4)$

(B) $\frac{3x-6}{4} + \frac{5}{7} = \frac{x+1}{2}$

(R) $\frac{x+3}{4} - 2 = \frac{5x-2}{3}$

(N) $\frac{4x}{3} - \frac{2x+3}{6} = \frac{9}{2}$

(P) $\frac{1}{10}(m+8) - \frac{1}{15}(m-5) = 1$

(T) $\frac{5x}{6} - \frac{3-x}{8} = \frac{4x+3}{12}$

(A) $\frac{3x-1}{4} + \frac{1}{2} = \frac{3}{8}$

(T) $\frac{5x}{6} - \frac{3-x}{8} = \frac{4x+3}{12}$

$$\frac{24x-8}{4} + \frac{8x}{2} = \frac{24}{8}$$

$$6x-2+4x=3$$

$$10x-2=3$$

$$\frac{10x}{10} = \frac{5}{10}$$

$$x = \frac{5}{10} \div \frac{1}{2}$$

$$x = \frac{5}{10} \cdot \frac{2}{1}$$

$$x = 1$$

$$x=1$$

$$x=1$$

$$x=1$$

$$x=1$$

$$x=1$$

$$x=1$$

$$x=1$$

$$x=1$$

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$$x=1$$

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$$x=1$$

$$x=1$$

(F) $\frac{1}{10}(m+8) - \frac{1}{15}(m-5) = 1$

(T) $\frac{5x}{6} - \frac{3-x}{8} = \frac{4x+3}{12}$

$30\left(\frac{1}{10}m + \frac{8}{10} - \frac{1}{15}m + \frac{5}{15}\right) = (1) \cdot 30$

$$\frac{30m}{10} + \frac{240}{10} - \frac{30m}{15} + \frac{150}{15} = 30$$

$$3m + 24 - 2m + 10 = 30$$

$$1m + 34 = 30$$

$$-34 \quad -34$$

$$m = -4$$

(F) $\frac{1}{10}(m+8) - \frac{1}{15}(m-5) = 1$

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$$3m + 24 - 2m + 10 = 30$$

$$1m + 34 = 30$$

$$-34 \quad -34$$

$$m = -4$$

Warm Up:

Directions: Carefully copy each question into your book. Solve by showing all of your work. Please circle or square your final answer.

$$1. 7 + \frac{x}{8} = -2$$

$$2. \frac{1}{3}x + \frac{1}{2}x = 10$$

$$3. \frac{1}{3}(x - 3) + \frac{2}{5}(2x + 1) = x + 5$$

Warm Up:

#15

Nov. 24

Copy each question into your notebook and solve by showing all of your work. Please circle or square your final answer.

$$1. \frac{5x - 1}{4} = \frac{2x + 5}{4}$$

$$2. \frac{2x - 3}{2} = \frac{3}{4}$$

$$3. \frac{2x + 2}{3} - \frac{5x}{4} = \frac{11}{6}$$

$$4. \frac{x + 3}{4} - 2 = \frac{5x - 2}{5}$$

Steps for Solving Problems using an Equation

- Step 1: Identify the variables
- Step 2: Let letters represent each variable (write your statement "let $x = \dots$ ")
- Step 3: Write the equation using the variables
- Step 4: Put in known variable
- Step 5: Do the math!!! Put the unknown variable all by itself.

Focus D: Solving Problems Pg. 108

Question:

The student council rented a bus to take fans to the basketball championship game.

- The basic cost to rent the bus is \$300
- The driver charges an additional \$1.50 per kilometer.
- The total bill was \$438

How far did the bus travel?

Cost
Distance

Solution:

1. Set up an equation:

Let "d" represent the number of kilometers traveled.

total cost = initial value + \$1.50 for each additional kilometer

2. Fill in and solve the equation:

$$y = 300 + 1.50d$$

$$438 = 300 + 1.50d$$

Subtract 300 from each side

$$138 = 1.50d$$

Divide by 1.50

$$92 = d$$

The bus travelled 92 km.

3. Check your answer:

Left-side

$$438$$

Right-side

$$300 + 1.50d$$

$$= 300 + 1.50(92)$$

$$= 438$$

$d = 92$ is correct!

The bus traveled 92 kilometers.

Let $C = \text{Cost}$

Let $K = \text{Number of km}$

Eqn. : $C = 300 + 1.50K$

$$\begin{array}{r} 438 = 300 + 1.50K \\ -300 \quad -300 \\ \hline 138 = 1.50K \end{array}$$

$$K = 92$$

$$\begin{array}{r} 138 = 1.50K \\ \underline{1.50} \quad \underline{1.50} \end{array}$$

The bus travelled 92 Km.

Classwork/Homework

- Page 109 #11, 12, 13
- For each of the questions do the following:
 - write the equation that models the situation
 - state what quantity each variable represents
 - solve the equation
 - verify each solution

Classwork/Homework

- Page 109 #11, 12, 13
- For each of the questions do the following:
 - write the equation that models the situation
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 - solve the equation
 - verify each solution

Pg. 109

11. a) $C = 5.00 + 0.01x$
 x represents # of pages

$$9.80 = 5.00 + 0.01x$$

$$\begin{array}{r} -5.00 \\ 4.80 = 0.01x \end{array}$$

$$\frac{4.80}{0.01} = \frac{0.01x}{0.01}$$

$$480 = x$$

The book has 480 pages

12. $C = 1.00 + 0.04x$

$$C = 1.00 + 0.04(480)$$

$$C = 1.00 + 19.20$$

$$C = 20.20$$

The cost would be \$20.20

13. Choice one is better
 Why? \$9.80 is better than \$20.20.

12

$$500 = 80 + 30x$$

x represents the # of days

$$\begin{array}{r} -80 \\ 420 = 30x \end{array}$$

$$\frac{420}{30} = \frac{30x}{30}$$

$$x = 14$$

Tickets were on sale for 14 days.

13. Opt. 1 $\rightarrow C = 5.00 + 0.04x$

Opt. 2 $\rightarrow C = 1.00 + 0.20x$

a) $40 = 5.00 + 0.04x$
 $\begin{array}{r} -5.00 \\ 35 = 0.04x \end{array}$

$$\frac{35}{0.04} = \frac{0.04x}{0.04}$$

$$x = 875$$

$$40 = 1.00 + 0.20x$$

$$\begin{array}{r} -1.00 \\ 39 = 0.20x \end{array}$$

$$\frac{39}{0.20} = \frac{0.20x}{0.20}$$

$$x = 195$$

Option 1

Questions:

1. Jenna went shopping for a new pair of shoes. She found some really cool sneakers for \$30 so she bought a pair. She also found some sandals on sale for \$8 each so she decided to get a few pairs. If her total was \$54, how many pairs of sandals did she buy?
2. Dan wanted to get a new cell phone. The cell phone company charges \$99 for the phone and \$0.35 per minute for airtime. If Dan's first bill (which included the cost of the phone) was \$141 dollars, how many minutes did Dan use in the first month?
3. Sienna took her friends to play mini golf. It costs \$4.50 for each person to play. Sienna paid \$31.50 for her and her friends. How many friends did she take?
4. Brandon was watching the Indy 500 race and cheering for his favourite driver, Al Unser Jr. For each pit stop Al made he lost 45 seconds. Brandon figured that in total Al lost 135 seconds off his time from pit stops. How many stops did the driver make?

Homework word problems.doc

Practice Word Problems.doc

Equation Riddles.doc

Extra Practice Worksheets

Equations worksheet.doc

Solving equations worksheet 2.doc

Solving equations worksheet 3.doc

Attachments

Equations.doc

Equation Riddles.doc

Solving for an Unknown 1.doc

Solving for an Unknown 2.doc

Word Problems Practice.doc

Writing word problems.doc

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